

(12) **United States Patent**
Pedersen

(10) **Patent No.:** **US 9,636,520 B2**
(45) **Date of Patent:** **May 2, 2017**

(54) **PERSONALIZED LIGHTING CONTROL**

(56) **References Cited**

(71) Applicant: **LIGHTEN APS**, Regstrup (DK)

U.S. PATENT DOCUMENTS

(72) Inventor: **Steen Hvidtfeldt Hessellund Pedersen**, Jyllinge (DK)

2005/0015122 A1* 1/2005 Mott A61M 21/00
607/88

(73) Assignee: **LIGHTEN APS**, Regstrup (DK)

2007/0138978 A1 6/2007 Rains, Jr. et al.
(Continued)

(*) Notice: Subject to any disclaimer, the term of this patent is extended or adjusted under 35 U.S.C. 154(b) by 638 days.

FOREIGN PATENT DOCUMENTS

WO WO2008/146219 12/2008
WO WO2009/044330 4/2009

(21) Appl. No.: **14/064,407**

(22) Filed: **Oct. 28, 2013**

(65) **Prior Publication Data**

US 2014/0052220 A1 Feb. 20, 2014

Related U.S. Application Data

(63) Continuation-in-part of application No. PCT/DK2012/050141, filed on Apr. 27, 2012.

OTHER PUBLICATIONS

International Search Report on corresponding PCT application (PCT/DK2012/050141) from International Searching Authority (EPO) dated Nov. 23, 2012.

(Continued)

(30) **Foreign Application Priority Data**

Apr. 28, 2011 (DK) 2011 70206
Dec. 14, 2011 (DK) 2011-70710
Apr. 23, 2013 (EP) 13164906

Primary Examiner — Ahmed Farah

(74) *Attorney, Agent, or Firm* — Klein, O'Neill & Singh, LLP

(51) **Int. Cl.**

A61B 19/00 (2006.01)

A61N 5/06 (2006.01)

(52) **U.S. Cl.**

CPC **A61N 5/0618** (2013.01); **A61N 2005/0642** (2013.01); **A61N 2005/0652** (2013.01); **A61N 2005/0665** (2013.01)

(58) **Field of Classification Search**

CPC .. A61N 5/0613; A61N 5/0618; A61N 5/0622; A61N 2005/0652;

(57)

ABSTRACT

A lighting system for initiating change in a mammal's circadian or well-being state includes a computational unit configured to receive state information regarding the mammal's circadian or well-being state, and operational information from a light sensor with spectral and luminosity sensitivity. The computational unit is configured to compare the operational information with the state information, and on the basis of this comparison, the computational unit outputs a control signal to a light control unit which, in turn, adjusts a controllable light source to vary its light output so as to initiate the desired change in the mammal's circadian or well-being state.

24 Claims, 24 Drawing Sheets

(Continued)

